

## Probability PRACTICE Unit Test

## Multiple Choice

Identify the choice that best completes the statement or answers the question.

B

1. Which events described below are independent?
- a. choosing 4 numbers in a bingo game
  - ☒ b. tossing 4 coins one at a time
  - c. choosing the officers of a club if each person can only hold one office
  - d. choosing 2 blue socks out of a drawer containing 4 blue and 4 black socks

Describe each event as inclusive, mutually exclusive, independent, or dependent.

A

2. Picking a queen or a spade.

- ☒ a. Inclusive
- b. Mutually Exclusive
- c. Independent
- d. Dependent

C

3. Picking two cards with replacement

- a. Inclusive
- b. Mutually Exclusive
- ☒ c. Independent
- d. Dependent

D

4. Taking three drinks from a cooler

- a. Inclusive
- b. Mutually Exclusive
- c. Independent
- ☒ d. Dependent

B

5. Rolling an even or an odd

- a. Inclusive
- ☒ b. Mutually Exclusive
- c. Independent
- d. Dependent

A

6. Rolling an even or a prime

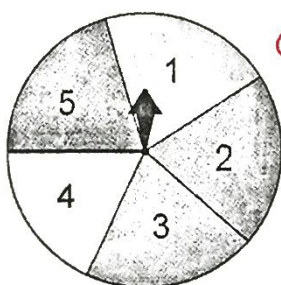
- ☒ a. Inclusive
- b. Mutually Exclusive
- c. Independent
- d. Dependent

Short Answer-Show ALL work. Write neatly. Box your answer if appropriate.

7. A factory manufactures plastic bottles of 5 different sizes, 4 different colors, and 2 different shapes. How many different bottles can be made?

$$5 \cdot 4 \cdot 2 = 40$$

8. Suppose a fair coin is tossed and the spinner below is spun one time. What is the probability of flipping heads and spinning a 1?



$\begin{matrix} H1 \\ H2 \\ H3 \\ H4 \\ H5 \end{matrix}$ 
 $\begin{matrix} T1 \\ T2 \\ T3 \\ T4 \\ T5 \end{matrix}$

$$\frac{1}{10}$$

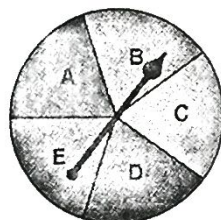
$$\frac{1}{2} \cdot \frac{1}{5} = \frac{1}{10}$$

9. David's science quiz has 8 multiple-choice questions. For each question, there are 5 possible answer choices. How many different choices for answering the 8 questions are possible?

$$5^8 = 390,625$$

10. Suppose a number cube labeled from 1 to 6 is rolled and the spinner below is spun one time. What is the probability of rolling a number less than 4 and spinning a B?

30 options



$\begin{matrix} 1A \\ 1B \\ 1C \\ 1D \\ 1E \end{matrix}$ 
 $\begin{matrix} 2A \\ 2B \\ 2C \\ 2D \\ 2E \end{matrix}$ 
 $\begin{matrix} 3A \\ 3B \\ 3C \\ 3D \\ 3E \end{matrix}$

$$\frac{3}{30} = \frac{1}{10}$$

$$\frac{3}{6} \cdot \frac{1}{5}$$

11. From a standard deck of 52 cards, 2 cards are selected *without replacement*. What is the probability that both cards selected are hearts?

$$\frac{13C_2}{52C_2} \text{ or } \frac{13 \cdot 12}{52 \cdot 51} = \frac{1}{17}$$

12. Two coins are tossed. Find the probability that one coin is a head and the other is a tail.

$$\frac{1}{2} \cdot \frac{1}{2} = \frac{1}{4}$$

13. A box contains 8 red marbles, 7 blue marbles, and 7 green marbles. What is the probability that a marble selected at random will be a red marble?

$$\frac{8}{22} = \frac{4}{11}$$

14. How many committees of 4 people can be chosen from a group of 9 people?

2

$$9C_4 = 126$$

15. Find the number of different ways the letters of the word CAMPS can be arranged if the first letter must be C.

$$\underline{1} \quad \underline{4} \cdot \underline{3} \cdot \underline{2} \cdot \underline{1} = 24$$

Determine whether the given event is independent or dependent. Then find the probability.

*Dependent*

16. A bag contains 5 black, 4 red, and 3 pink balls. If 3 balls are selected one after the other, *without replacement*, what is the probability that 3 red balls are chosen?

$$\frac{4}{12} \cdot \frac{3}{11} \cdot \frac{2}{10} = \frac{24}{1320} = \frac{1}{55}$$

17. Troy has six \$1, three \$5, and two \$10 gift certificates. If he selects three gift certificates in succession, what is the probability that a \$1 gift certificate is selected, *then* a \$5 gift certificate and *then* a \$10 gift certificate *if replacement does not take place*?

$$\frac{6}{11} \cdot \frac{3}{10} \cdot \frac{2}{9} = \frac{36}{990} = \frac{2}{55}$$

18. In how many different ways can 10 cars arrive at a fast-food restaurant's drive-up window?

$$10P_{10} = 3,628,800$$

19. How many ways can 6 people be seated in 6 seats?

$$6P_6 = 720$$

20. A bag contains 10 pencils, 5 ball point pens, and 3 sketch pens. Ronald takes out one writing object from this bag to note down some important information. What is the probability that a ball point pen or a pencil is selected?

$$\frac{15}{18} = \frac{5}{6}$$

A dice is rolled. What is the probability of rolling the following?

21. a multiple of 3 <sup>3, 6</sup> or a prime <sup>2, 3, 5</sup>

$$\frac{4}{6} = \frac{2}{3}$$

22. Tina has to create a password for the security of a software program file. She wants to use a password with 4 letters. How many passwords are allowed *if no letters are repeated and the password is not case sensitive*?

$$26 \cdot 25 \cdot 24 \cdot 23 = 358,800$$

23. A box contains 4 videotapes and 12 DVDs. In how many ways can one videotape and one DVD be selected?

$$4C_1 \cdot 12C_1$$

3

$$4 \cdot 12 = 48$$

Name: \_\_\_\_\_

ID: A

Find the odds of an event occurring given the probability of the event.

24.  $\frac{1}{20}$       1:19

25.  $\frac{2}{9}$       2:7

26. What is the probability of getting a 3 each time if a die is rolled 4 times?

$$\left(\frac{1}{6}\right)^4 = \frac{1}{1296}$$

Determine whether the given event is mutually exclusive or inclusive. Then find the probability.

27. A card is drawn from a standard deck of cards. *Mutually exclusive*

$P(5 \text{ or jack})$        $\frac{4}{52} + \frac{4}{52} = \frac{8}{52} = \frac{2}{13}$

28. A coin is tossed.

$P(\text{head or tail})$       *Mutually Exclusive*  
 $\frac{1}{2} + \frac{1}{2} = 1$

29. A fruit basket contains 5 apples and 11 oranges. Sarah randomly selects one, *puts it back*, and then randomly selects another. What is the probability that both selections were oranges?

$$\frac{11}{16} \cdot \frac{11}{16} = \frac{121}{256}$$

Laura has moved to a new apartment. Her schoolbooks comprised of different subjects are mixed in a bag during the move. Four books are of mathematics, three are English, and six are science. If Laura opens the bag and selects books at random, find the given probability.

30.  $P(1 \text{ english and } 2 \text{ mathematics books})$

$$\frac{{}^3C_1 \cdot {}^4C_2}{{}^{13}C_3} = \frac{18}{286} = \frac{9}{143}$$

31.  $P(3 \text{ science books})$

$$\frac{{}^6C_3}{{}^{13}C_3} = \frac{20}{286} = \frac{10}{143}$$